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AMERICAN BEAUTYBERRY
(*Callicarpa americana*)

Section 7.5.8, U.S. ARMY CORPS OF ENGINEERS
WILDLIFE RESOURCES MANAGEMENT MANUAL

by

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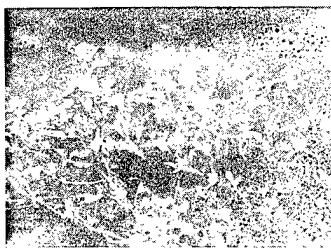
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PREFACE

This work was sponsored by the Headquarters, U.S. Army Corps of Engineers (HQUSACE), as part of the Ecosystem Management and Restoration Research Program (EMRRP), Work Unit 32420, entitled Development of U.S. Army Corps of Engineers Wildlife Resources Management Manual. Mr. Dave Mathis, CERD-C, was the EIRP Coordinator at the Directorate of Research and Development, HQUSACE. The Program Monitors for the study were Ms. Cheryl Smith, Mr. F. B. Juhle, and Mr. Forrester Einarsen, HQUSACE. The report serves as a section of the U.S. Army Corps of Engineers Wildlife Resources Management Manual.

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NOTE TO READER

This report is designated as Section 7.5.8 in Chapter 7 -- PLANT MATERIALS, Part 7.5 -- WOODY SPECIES, of the U.S. ARMY CORPS OF ENGINEERS WILDLIFE RESOURCES MANAGEMENT MANUAL. Each section of the manual is published as a separate Technical Report but is designed for use as a unit of the manual. For best retrieval, this report should be filed according to section number within Chapter 7.

AMERICAN BEAUTYBERRY (*Callicarpa americana*)

Section 7.5.8, U.S. ARMY CORPS OF ENGINEERS WILDLIFE RESOURCES MANAGEMENT MANUAL

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Trademark bright purple rings of berry-like clusters identify American beautyberry (*Callicarpa americana*) in southern woodlands and field borders from summer into winter. Found in a variety of habitats, the coarse, open shrub, which can grow to about 7 ft (2.2 m), provides fruit for a number of bird and mammal species. Beautyberry occurs frequently throughout the coastal plain of the southeastern United States but is apparently short-lived (about 10 years) (Odenwald and Turner 1988).

American beautyberry, also called French mulberry, Spanish mulberry, Bermuda mulberry, sourbush, and sow-berry (Lay 1961, Halls 1977), is the only species of *Callicarpa* native to the United States. About 135 species of *Callicarpa* are found in the tropics and subtropics of Asia, Australia, North America, and Central America (Bailey and Bailey 1976). The genus is placed taxonomically in the verbena family (Verbenaceae).

This report was prepared as a guide to assist biologists and natural resources personnel with the selection, cultivation, and management of plant materials for wildlife and habitat development programs. Major topics covered are description, distribution, habitat requirements, wildlife value, establishment, and cautions and limitations. Wildlife management programs on U.S. Army Corps of Engineers lands should emphasize the use of native plant materials to improve habitat diversity and support a variety of game and nongame wildlife species.

DESCRIPTION

American beautyberry is a deciduous, many-branched shrub 3 to 8 ft (1 to 2.5 m) tall with slender, radiating stems and relatively open, upright growth (Radford et al. 1968, Coastal Zone Resources Division 1978). It can be mound-shaped but is usually irregular, spreading, and loosely branched in form. The species can appear as a single plant or in colonies (Vines 1960, Grelen and Duvall 1966, Coastal Zone Resources Division 1978, Odenwald and Turner 1988). Twigs are round or 4-sided, gray to reddish brown and densely pubescent, becoming glabrous later. Older stems are brittle and usually have small, thin scales (Grelen and Duvall 1966, Radford et al. 1968, Foote and Jones 1989).

The aromatic, soft-textured leaves are simple, opposite, and occasionally ternate (present in threes) (Fig. 1). The upper leaf surface is dark green to yellow green and glabrous to slightly pubescent, while the ventral surface is paler and pubescent with stellate trichomes (glands) (Radford et al. 1968). Leaves are oval to elliptical in shape, 3 to 9 in. (7.6 to 23 cm) long, and approximately 2 to 5 in. (5 to 12.7 cm) wide; they taper to points at both the apex and base and have coarsely toothed margins and prominent veins (Vines 1960, Grelen and Duvall 1966, Radford et al. 1968, Coastal Zone Resources Division 1978). The pubescent petioles are 0.6 to 1.4 in. (1.5 to 3.5 cm) long (Grelen and Duvall 1966, Radford et al. 1968, Odenwald and Turner 1988).

The perfect, pale blue to pale pink flowers are 0.12 to 0.2 in. (3 to 5 mm) long and form clusters of 0.33 to 1.5 in. (0.85 to 3.8 cm) at the leaf axils of current growth (Vines 1960, Grelen and Duvall 1966, Radford et al. 1968, Dillon 1981). Flowering begins as early as March and April but is most abundant in June and July. Flowers and new leaves may be produced at branch tips throughout the summer and early fall, even while mature fruits are present on the same plant (Grelen and Duvall 1966).

The showy, bright violet- to reddish-purple drupes (sometimes called berries) are the most prominent characteristic of American beautyberry (Fig. 1). The drupes are 0.13 to 0.25 in. (3 to 6 mm) in diameter and are borne in the leaf axils in dense, round clusters that encircle the stem at regular intervals (Vines 1960, Grelen and Duvall 1966, Foote and Jones 1989). A drupe contains 4 yellowish brown seeds, each of which is about 0.03 in. (0.7 mm) long, rounded on the back, and flattened on the inner surface (Radford et al. 1968, Halls 1977). The drupes may be noticeable as early as June but become more conspicuous with maturity in late summer and early fall. Fruits persist well into winter if not eaten by birds and other wildlife (Grelen and Duvall 1966, Foote and Jones 1989).



Figure 1. American beautyberry (*Callicarpa americana*), showing clusters of drupes (top) and close-up of drupes and foliage (bottom)

DISTRIBUTION

American beautyberry is native to the southeastern United States and commonly occurs in all states of the region except Kentucky. The species ranges from coastal Maryland south through the northern two-thirds of Florida and west to extreme southern Missouri, eastern Texas, and eastern Oklahoma (Halls 1977, Coastal Zone Resources Division 1978, Odenwald and Turner 1988). It is also found in Mexico and the West Indies (Grenen and Duvall 1966, Bailey and Bailey 1976). Beautyberry is sometimes planted as an ornamental outside its natural range.

HABITAT REQUIREMENTS

American beautyberry is characterized as a hardy, drought-tolerant shrub, which is most common in the sandy lowlands of the southeastern coastal plain (Radford et al. 1968). Plants withstand average winter minimum temperatures of 0° to 10° F (-17.8° to -12.2° C) in the northern portion of its range (Wigginton 1963) and summer temperatures exceeding 100° F (37.8° C) in the southern extreme (U.S. Department of the Interior 1970). The length of the growing season within its range varies from about 300 days in Florida and Texas to about 200 days on the Virginia-Maryland coast.

Beautyberry is a pioneer species in plant succession, appearing after land clearing in open sunny areas, especially near woodlands (Odenwald and Turner 1988) and often along road edges and field borders (Dillon 1981). Plants are often found at the edges of woods (Brown and Tighe 1991) and in forest openings resulting from tree fall and other natural disturbances. It is also a common component of managed landscapes (Martin et al. 1951, Martin and Sick 1995).

Beautyberry occurs in a variety of forest types within the southern coastal plain. It is often found in tall, open pine stands with high, relatively thin canopies (Lay 1961, Grenen and Duvall 1966, Halls 1977). It occurs in the highest and best-drained areas of bottomland hardwood forests where it is most often associated with water oak¹, American beech, and hickories (Pearson 1975, Conner et al. 1990), and in bottomland to upland transition zones where it is found with oak, ash, and hickory species (Taylor et al. 1990). Beautyberry is a common understory species of shortleaf pine-oak habitats, along with parsley hawthorn, witch hazel, flowering dogwood, blueberries, greenbriers, and black haw viburnum (Newsom 1984). It is a typical species of the upland hardwood-hammock plant association in Florida and adjacent states (Soil Conservation Service 1989). Beautyberry also grows in the longleaf pine-turkey oak/sand-hill association, mixed

¹ The scientific names of plant species referenced in the text are given in Appendix A.

hardwood-pine forests, south Florida flatwoods, cabbage palm flatwoods, and wetland hardwood-hammock plant communities (Soil Conservation Service 1989, Martin and Sick 1995). In the live oak savannas of Texas, beautyberry is found with live oak, yaupon, and greenbriers (Springer 1977). It is found infrequently in the piedmont region and is rare in the southern mountain region (Radford et al. 1968).

Soils

Beautyberry grows well in moist, moderately to well-drained, fertile loams (Martin et al. 1951, Dillon 1981). Martin and Sick (1995) stated that beautyberry occurs mainly on sandy soils with low to moderate fertility. However, it is tolerant of most soils and is often found on poor, clay soils along woodland edges (Odenwald and Turner 1988). Beautyberry will grow on dry, rocky sites and can survive soil conditions of low fertility and high salt content (Batson 1942, Coastal Zone Resources Division 1978). Plants are generally found in soils with pH 5.2 to 7.0 (Coastal Zone Resources Division 1978). Beautyberry is tolerant of acid and infertile soils characteristic of surface-mined sites and has naturally colonized several phosphate mine reclamation areas in central Florida (Martin and Sick 1995).

Shade

Beautyberry grows best in full sun to partial shade but will tolerate full sun to full shade (Coastal Zone Resources Division 1978, Odenwald and Turner (1988). Fruit yields are abundant from plants grown in the sun, but low from those grown in full shade (Odenwald and Turner 1988). An east Texas study comparing plants grown in the open to those grown in the woods found that plants receiving the most sunlight grew more rapidly and produced more fruit for the first 5 years. However, after that age, the open-site beautyberries usually declined, resulting in decreased fruit yield. The woods-grown plants developed more slowly, but differences in fruit production between the two groups lessened with age and were similar at age 12 (Halls 1977).

Moisture

Year-round moist conditions favor beautyberry, but the species can tolerate dry conditions. Plants may wilt during droughts but can usually survive, even on very dry sites such as those that support scrub post oaks (Lay 1961). Beautyberry is reported to occur on xeric sites in Florida (Cerulean et al. 1986) and semixeric sites in south-central Texas. Beautyberry is extremely sensitive to flooding; Martin and Sick (1995) reported very low survival of plants that were inundated once or twice in test plots during the growing season.

WILDLIFE VALUE

Food Value

Beautyberry is considered to have medium food and cover value for wildlife (Coastal Zone Resources Division 1978). However, since it is only occasionally used by birds for nesting cover (Davison 1967), its primary wildlife value can be attributed to abundant fruit production. The bright purple drupes are a preferred food of numerous birds and small mammals (Grelan and Duvall 1966, Stransky and Richardson 1977) and are also sought by white-tailed deer (Lay 1961). Availability of the fruit in late summer and early fall renders beautyberry especially beneficial at times when other sources of wild fruits are scarce. The high water content of the fruits adds to their wildlife value during dry seasons (Halls 1977). The persistent drupes can provide winter food but are usually eaten by late autumn (Stransky and Richardson 1977, Odenwald and Turner 1988).

Studies of stomach contents reveal that at least 10 species of birds feed on beautyberry fruit (Vines 1960), but the literature indicates wider usage (Table 1). Davison (1967) considers the fruit a choice food of the red-whiskered bulbul,¹ northern cardinal, northern mockingbird, brown thrasher, and wood thrush. Other authors add to that list the gray catbird, American robin, northern oriole, and northern bobwhite (Martin et al. 1951, Vines 1960, Foote and Jones 1989). Other birds known to utilize the drupes are the rufous-sided towhee, woodpeckers, yellow-breasted chat, sparrows, eastern bluebird, and wild turkey (Martin et al. 1951, Barwick et al. 1973, Dillon 1981, Cerulean et al. 1986, Foote and Jones 1989). Mammals that eat beautyberry fruits include raccoons, opossums, gray foxes, squirrels, and black bears (Martin et al. 1951, Vines 1960, Halls 1977, Black Bear Conservation Commission 1992). When available, the fruit is an important food source for white-tailed deer in some parts of the southern coastal plain during late autumn and early winter (Newsom 1984). Stomach analyses of deer in east Texas showed heavy use in late November (Lay 1961).

Beautyberry leaves are occasionally eaten by wood rats, and both deer and livestock readily consume the foliage and twigs (Martin et al. 1951, Halls 1977). The plant is a common browse species of white-tailed deer in some parts of the southern coastal plain; greatest utilization occurs in spring, summer, and fall (Newsom 1984) with occasional use in early winter (Halls 1977). The twigs and foliage are a minor component of white-tailed deer diet in Alabama (Stribling 1988). Cattle (*Bos taurus*) will generally eat beautyberry leaves after grass matures and will browse the twigs during winter (Grelan and Duvall 1966). Deer and cattle may even compete for foliage during the growing season (Lay 1961).

¹ Scientific names of wildlife species are given in Table 1.

Table 1
Wildlife Reported to Use American Beautyberry

| <u>Songbirds</u> | <u>Fruit</u> | <u>Forage</u> |
|--|----------------|---------------|
| Eastern bluebird (<i>Sialia sialis</i>) | X ¹ | |
| Northern cardinal (<i>Cardinalis cardinalis</i>) | * ² | |
| Gray catbird (<i>Dumetella carolinensis</i>) | * | |
| Northern mockingbird (<i>Mimus polyglottos</i>) | * | |
| American robin (<i>Turdus migratorius</i>) | * | |
| Northern oriole (<i>Icterus galbula</i>) | * | |
| White-throated sparrow (<i>Zonotrichia albicollis</i>) | X | |
| Chipping sparrow (<i>Spizella passerina</i>) | | X |
| Song sparrow (<i>Melospiza melodia</i>) | X | |
| Brown thrasher (<i>Toxostoma rufum</i>) | * | |
| Wood thrush (<i>Hylocichla mustelina</i>) | * | |
| Rufous-sided towhee (<i>Pipilo erythrrophthalmus</i>) | X | |
| Red-whiskered bulbul (<i>Pycnonotus jocosus</i>) | * | |
| Woodpeckers (species not noted) | | X |
| Yellow-breasted chat (<i>Icteria virens</i>) | | X |
| <u>Game Birds</u> | | |
| Wild turkey (<i>Meleagris gallopavo</i>) | X | |
| Northern bobwhite (<i>Colinus virginianus</i>) | * | |
| <u>Mammals</u> | | |
| White-tailed deer (<i>Odocoileus virginianus</i>) | * | * |
| Black bear (<i>Ursus americanus</i>) | * | |
| Squirrels (<i>Sciurus spp.</i>) | X | |
| Raccoon (<i>Procyon lotor</i>) | X | |
| Virginia opossum (<i>Didelphis virginiana</i>) | X | |
| Gray fox (<i>Urocyon cinereoargenteus</i>) | X | |
| Eastern woodrat (<i>Neotoma floridana</i>) | | X |

Sources: Vines (1960), Davison (1967), Barwick et al. (1973), Halls (1977), Dillon (1981), Cerulean et al. (1986), Foote and Jones (1989), BBCC (1992).

¹ X = use documented.

² * = choice or important food.

Halls (1977) considered beautyberry to be medium in white-tailed deer preference but speculated that it may be a major part of deer diet when highly preferred foods are scarce. In east Texas, about one-fourth of the available leaves and twigs were eaten on areas with moderate deer pressure, and more than one-half of the current growth was used on sites with heavy pressure (Lay 1961). Lay (1961) estimated that beautyberry on open sites can withstand 40 percent annual utilization by white-tailed deer, although optimum use is somewhat less. Only 6 years of moderate

deer pressure on beautyberry in a fully stocked pine forest reduced green browse production from 21 to 6 pounds per acre (114 to 33 kg per ha).

Although beautyberry is a component of ungulate diets in some areas of the southern coastal plain, it was found to be absent in cattle and white-tailed deer diets in Mississippi (Mitchell 1980). Extensive rumen and fecal analyses showed almost no utilization of beautyberry by either species in longleaf pine forests of southeast Mississippi and in mixed pine-hardwood forests of central Mississippi. The frequency of occurrence for beautyberry in those forests was greater than 30%; however, other choice foods, such as acorns and evergreen browse, were highly available during the fall and winter months.

Nutritional Value

Based on its chemical composition and digestibility, beautyberry was rated medium for wildlife use (Short and Epps 1977). Fruits are relatively low in crude protein (6.9%) and phosphorus (0.32%) and medium in nitrogen free extract (53.6%) and calcium (0.25%) (Short and Epps 1976, Halls 1977). Crude protein, phosphorus, and calcium levels during rapid spring growth meet maintenance and growth requirements for deer and cattle. Protein and phosphorus decline below adequate levels as growth stops and foliage ages, but calcium levels remain adequate (Stransky and Halls 1976, Halls 1977). In east Texas, mean crude protein in leaves varied from 23.4% in April to 10.2% in September; mean phosphorus dropped from 0.26% to 0.12%, and calcium increased from 0.622% to 1.238% (Stransky and Halls 1976).

Nutrient content and palatability are higher than average in plants on recently burned range (Halls 1977). Springer (1977) found than mean crude protein was significantly higher on burned areas than on unburned areas in a Texas live oak habitat. Lay (1961) found spring crude protein levels of 22% and phosphoric acid levels of 0.74% on burned areas in east Texas pineywoods, compared with 18% and 0.45%, respectively, on unburned areas.

Fresh beautyberry fruits are approximately 80% water, 10% pulp, and 10% seed. There are about 30 drupes per cluster, and plants produce an average of nearly 0.25 lb (113 g) of fruit per 4-ft (12-dm) plant (Lay 1961).

ESTABLISHMENT

Site Selection

As previously discussed, American beautyberry grows best in moist, moderately to well-drained fertile soils with full to partial shade and is especially well suited to the edges of fields and woodlands. Therefore, it can be established in hedgerows and roadside plantings or under tall

canopies of relatively open pine forests. Beautyberry may also be planted on surface-mined sites for use in restoration of reclaimed lands (Martin and Sick 1995).

Because beautyberry is easy to propagate, needs little culture, has wildlife food value, and produces attractive fruit, it is a good specimen choice for landscaping yards and park sites (Batson 1942, Foote and Jones 1989). Landscaping recommendations are provided in Bir (1992), Martin (1994), and Zona (1994).

Propagules

Although a commonly occurring native shrub, beautyberry is not readily available in the landscaping trade, and cultivars are lacking (Odenwald and Turner 1988). Only one variety, *Callicarpa americana lactea* F.J. Muller, was noted by Bailey and Bailey (1976). Except for its white fruit, *C.a. lactea* is similar to common beautyberry and is sometimes found growing with it (Vines 1960). Bir (1992) commented that the white-fruited variety grows well on the edge of deep shade and, unlike the sometimes clashing colors of the *C. americana* wild type, complements nearly all surrounding vegetation.

Seeds. American beautyberry is easily propagated by seeds and stem cuttings (Halls 1977). Seeds should be collected as soon as the drupes are ripe. Seeds can be easily squeezed from the fruit after the first killing frost (Bir 1992, Young and Young 1992). The small seeds will usually germinate without scarification or stratification, but a period of warm after-ripening is needed. This requirement can be satisfied by storing the seeds at room temperature before sowing them the following spring in nursery beds or in the field. Fresh seeds will usually germinate in about 3 months.

Beautyberry seeds placed in nursery beds should be sown in an artificial growing media, such as a combination of three parts pine bark mulch to one part sphagnum peat or any commercial potting mix suitable for azaleas (Bir 1992). Soil should not be used, since it drains poorly and may contain insects, disease organisms, and weed seeds. The media should be moistened before seeds are sown at a depth 4 times their width, or about 0.13 in. (3 mm) deep. The container should be covered with plastic and placed in a warm, well-lit location but not in direct sunlight. The plastic can be removed after seeds sprout. Seedlings with true leaves can be fertilized with a quality house plant food at one-half the suggested rate every 7 to 10 days for 6 weeks. Full-strength plant food can then be used until the seedlings are transplanted. Plants grown in the nursery can be outplanted the next winter and sustain few losses from transplanting (Halls 1977).

Seeds planted outdoors should be sown in beds that receive at least 6 hours of sunlight per day and have well-drained, fertile soil that has been turned, raked, and leveled (Bir 1992). Until seeds sprout, the beds should be kept moist, especially when temperatures increase in the spring. After true leaves appear, plants should be watered to a depth of about 1 in. (2.5 cm) only when the soil is

dry. Fertilization of woody plants in prepared seedbeds is usually not necessary the first season, but growth can be accelerated by applying a balanced liquid fertilizer (10-10-10) every 2 weeks until 6 weeks before the average first-frost date in the fall.

Seedlings. Seedlings grown outdoors should be transplanted when dormant (mid-to-late winter) as soon as possible after the soil thaws (Bir 1992). Container-grown plants can be transplanted to a garden area in the fall. Second-year seedlings usually transplant better than first-year seedlings. Survival was better with 2.5-year-old seedlings than with 1.5-year-old seedlings in out-planting field tests in South Carolina (Martin and Sick 1995). All first-year transplants should be mulched for winter, but mulch should be removed in the spring when there is no danger of temperatures dropping below 25° F (-3.9° C). In reclamation plantings, surface mulching is recommended to promote the growth and survival of out-planted beautyberry stock. Plants to be grown for 2 seasons before transplanting should be fertilized before buds start to swell in the spring, usually 4 to 6 weeks before the last frost date, but plants to be removed from seedbeds in late winter should not be fertilized before transplanting (Bir 1992).

Cuttings. Softwood or semihard stem cuttings that are mature but still easily snapped can be taken during summer and early fall (Halls 1977, Coastal Zone Resources Division 1978, Young and Young 1992). If outplanted in late winter, these cuttings should produce fruit the following summer (Halls 1977). Cuttings should be taken from young wood and be 4 to 6 in. (10 to 15 cm) long, if possible. Cuttings can be inserted stem end down about 1 in. (2.5 cm) into a rooting medium with the base of each cutting at least 1 in. (2.5 cm) above the bottom of the container. Most cuttings will root best when the temperature of the rooting medium is 70° to 75° F (21° to 24° C). The stuck cuttings should be watered and covered with plastic to prevent drying. Rooting should begin within a few weeks; when it starts, the plastic cover may be removed at longer intervals each day for 7 to 10 days, after which time it can be permanently removed (Bir 1992).

Rooting may be stimulated by dipping or treating about 0.25 in. (6 mm) of the end of the cutting with 1,000 ppm IBA (indolebutyric acid) mixed with talc or with NAA (naphthaleneacetic acid), commonly found in commercial applications such as Rootone (Bir 1992, Young and Young 1992). However, beautyberry cuttings usually root without treatment if they are properly gathered, prepared, stuck, and misted (Halls 1977, Bir 1992).

Site Preparation

Competing vegetation should be removed in an area appropriate to the size and number of shrubs or seedlings to be planted (Henderson 1987). Soil testing should be conducted on proposed planting sites to determine the need for fertilizer, lime, and soil amendments. Phosphorus should be mixed with the top 6 to 8 in. (15 to 20 cm) of soil before plants are set, and nitrogen should be applied sparingly to the surface a few weeks after planting.

In poorly drained clay soils, drainage can be improved by raising the planting area with topsoil skimmed from an adjacent site or by adding organic matter as a soil amendment (Bir 1992). There is some evidence that native soil is best for plant establishment (Foote and Jones 1989), but amendments can increase the air spaces available in heavy soils and the capacity to hold water and fertilizer in sandy soils (Bir 1992). The bark of southern yellow pine is generally recommended as an amendment for the Southeast (Foote and Jones 1989, Bir 1992). It should be spread to a depth of 4 in. (10 cm) over an area at least twice the size the plant will cover and mixed thoroughly with the top 6 to 8 in. (15 to 20 cm) of soil (Bir 1992). Backfill for individual planting holes can be amended in the same way.

Planting Methods

While dormant, rooted cuttings and seedlings should be planted 4 to 6 ft (1.2 to 1.8 m) apart and with vegetative cover at exposed sites (Coastal Zone Resources Division 1978). Larger seedlings and shrubs should be planted in holes approximately twice as wide as the root mass and about 12 in. (30.5 cm) deeper. Root coverings should be removed and the roots spread apart before planting seedlings to the depth at which they had been growing. Holes should be backfilled to the soil line; the soil should be firmed, watered thoroughly, and mulched (Foote and Jones 1989). Fertilizer can be used to improve growth during establishment; it should be applied just before the appearance of new growth in the spring.

MAINTENANCE

Regular maintenance, which includes weed control, watering, and fertilization, may be necessary during establishment. Shrubs that eventually become too leggy or too large for the space may be cut back in the winter as severely as needed, almost to the ground (Coastal Zone Resources Division 1978). Drastic pruning does not prevent fruiting but rather stimulates new stem growth that will produce flowers and fruit during the following growing season (Coastal Zones Resources Division 1978, Bir 1992).

Beautyberry is usually pest and disease free, although plants may occasionally be attacked by defoliating insects. Spraying with Sevin will normally alleviate that problem (Coastal Zone Resources Division 1978). Arthropods observed most commonly on beautyberry plants established in plots in South Carolina were stinkbugs (Pentatomidae), ants (Formicidae), and assassin bugs (Reduviidae). Many small beetles, spiders, and parasitic wasps (Hymenoptera) were noted on beautyberry clusters (Martin and Sick 1995).

FOREST MANAGEMENT

Beautyberry shrubs are best maintained in the forest by moderate disturbance (Halls 1977). However, mechanical site preparation treatments, such as chopping and soil scraping (KG blading), can reduce occurrence and fruit yield (Stransky and Richardson 1977). Beautyberry is more persistent than most shrubs on ranges that are burned periodically but is not as fire tolerant as wax myrtle (Grenen and Duvall 1966). It readily sprouts after a winter burn and will usually resprout from the rootstock if stems are killed by fire (Halls 1977). Fruit yields and nutritive values have been found to be higher on sites subjected to moderate winter fires (Stransky and Richardson 1977).

The quantity and quality of beautyberry can be enhanced in a forested habitat with a combination of timber harvest (thinning), retention of forest openings, and occasional prescribed burning. All forest management practices should be planned, scheduled, and implemented on a rotating, landscape-wide basis to create the habitat diversity necessary to ensure that a variety of quality browse species will be available.

LITERATURE CITED

Bailey, L. H., and E. Z. Bailey. 1976. *Hortus Third: A Concise Dictionary of Plants Cultivated in the United States and Canada*. McMillan, New York. 1312 pp.

Barwick, L. H., W. M. Hetrick, and L. E. Williams, Jr. 1973. Foods of young Florida wild turkeys. *Proc. Southeast. Assoc. Fish and Wildl. Agencies* 27:92-102.

Batson, F. S. 1942. An illustrated guide to identification and landscape uses of Mississippi native shrubs. *Miss. Exp. Sta., Miss. State Univ.* 61 pp.

Bir, R. E. 1992. *Growing and Propagating Showy Native Woody Plants*. Univ. North Carolina Press, Chapel Hill. 192 pp.

Black Bear Conservation Commission. 1992. *Black bear management handbook of Louisiana, Mississippi and east Texas*. Baton Rouge, La. 29 pp.

Brown, M. T., and R. E. Tighe. 1991. Techniques and guidelines for reclamation of phosphate mined lands. *Cent. for Wetlands, Univ. Fla., FIPR Publ. No. 03-044-095. Florida Inst. Phosphate Res., Barstow*.

Cerulean, S., C. Botha, and D. Legare. 1986. *Planting a refuge for wildlife: How to create a backyard habitat for Florida's birds and beasts*. Florida Game and Fresh Water Fish Comm. Nongame Wildl. Program, Tallahassee. 33 pp.

Coastal Zone Resources Division. 1978. *Handbook for terrestrial wildlife habitat development on dredged material*. Tech. Rep. D-78-37. U.S. Army Eng. Waterways Exp. Sta., Vicksburg, MS. 353 pp.

Conner, W. H., R. T. Huffman, and W. M. Kitchens. 1990. Composition and productivity in bottomland hardwood forest ecosystems: The report of the vegetation workshop. Pages 455-480 In J. G. Gosselink, L. C. Lee, and T. A. Muir, eds. *Ecological Processes and Cumulative Impacts: Illustrated by Bottomland Hardwood Ecosystems*. Lewis Publ., Chelsea, Mich.

Davison, V. E. 1967. *Attracting Birds: From the Prairies to the Atlantic*. Thomas Y. Crowell Co., New York. 251 pp.

Dillon, O. W. 1981. *Invite birds to your home: Conservation plantings for the Southeast*. USDA Soil Conserv. Serv., Program Aid 1093. 16 pp.

Foote, L. E., and S. B. Jones. 1989. *Native Shrubs and Woody Vines of the Southeast: Landscaping Uses and Identification*. Timber Press, Portland, Oreg. 199 pp.

Grelan, H. E., and V. L. Duvall. 1966. Common plants of longleaf pine-bluestem range. *USDA For. Serv. Res. Pap. SO-23*. 96 pp.

Halls, L. K. 1977. American beautyberry/*Callicarpa americana* L. Pages 24-26 In L. K. Halls, ed. *Southern fruit-producing woody plants used by wildlife*. *USDA For. Serv. Gen. Tech. Rep. SO-16*. 235 pp.

Henderson, C. L. 1987. *Landscaping for wildlife*. Minn. Dep. Nat. Resour., St. Paul. 145 pp.

Lay, D. W. 1961. American beautyberry. Pages 4-5 In L. K. Halls and T. H. Ripley, eds. Deer browse plants of southern forests. USDA For. Serv., South. For. Exp. Sta., New Orleans, La., and Southeast. For. Exp. Sta., Asheville, N.C. 78 pp.

Martin, A. C., H. S. Zim, and A. L. Nelson. 1951. American Wildlife and Plants. Dover Publ., New York. 500 pp.

Martin, H. 1994. More on beautyberry. Palmetto 14(1):5-6.

_____, and G. Sick. 1995. American beautyberry for borrow pit reclamation in South Carolina. Restoration and Manage. Notes 13(1):90-96.

Mitchell, W. A. 1980. Evaluation of white-tailed deer and cattle diets in two southeastern pine forests. Ph.D. diss., Miss. State Univ., Miss. State. 236 pp.

Newsom, J. D. 1984. Coastal plain. Pages 367-380 In L. K. Halls, ed. White-tailed Deer: Ecology and Management. Stackpole Books, Harrisburg, Pa. 870 pp.

Odenwald, N. G., and J. R. Turner. 1988. Plants for the South: A Guide for Landscaping Design. Claitor's Publ. Div., Baton Rouge, La. 565 pp.

Pearson, H. A. 1975. Multiple-use inventories in Louisiana forests. Proc. Southeast. Assoc. Fish and Wildl. Agencies 29:682-686.

Radford, A. E., H. E. Ahles, and C. R. Bell. 1968. Manual of the Vascular Flora of the Carolinas. Univ. North Carolina Press, Chapel Hill. 1183 pp.

Short, H. L., and E. A. Epps, Jr. 1976. Nutrient quality and digestibility of seeds and fruits from southern forests. J. Wildl. Manage. 40:283-289.

_____. 1977. Composition and digestibility of fruits and seeds from southern forests. Special Rep., USDA For. Serv. South. For. Exp. Sta., New Orleans, La.

Soil Conservation Service. 1989. Twenty-six ecological communities of Florida. Supplement to SCS Technical Guides for Florida, 1985. U.S. Department of Agriculture. Reprinted by Fla. Chapter, Soil and Water Conserv. Soc., Gainesville.

Springer, M. D. 1977. The effects of prescribed burning on browse, forbs and mast in a Texas live oak savannah. Proc. Southeast. Assoc. Fish and Wildl. Agencies 31:188-198.

Stransky, J. J., and L. K. Halls. 1976. Browse quality affected by pine site preparation in east Texas. Proc. Southeast. Assoc. Fish and Wildl. Agencies 30:507-512.

Stransky, J. J., and D. Richardson. 1977. Fruiting of browse plants affected by pine site preparation in east Texas. Proc. Southeast. Assoc. Fish and Wildl. Agencies 31:5-7.

Stribling, H. L. 1988. White-tailed deer management. Ala. Coop. Extension Serv., Circ. ANR-521. Auburn Univ.

Taylor, J. R., M. A. Cardamone, and W. J. Mitsch. 1990. Bottomland hardwood forests: Their functions and values. Pages 13-86 In J. G. Gosselink, L. C. Lee, and T. A. Muir, eds. Ecological Processes and Cumulative Impacts: Illustrated by Bottomland Hardwood Wetland Ecosystems. Lewis Publ., Chelsea, Mich.

U.S. Department of the Interior. 1970. The national atlas of the United States of America. Geol. Survey, Washington, D.C. 417 pp.

Vines, R. A. 1960. Trees, Shrubs, and Vines of the Southwest. Univ. Tex. Press, Austin. 1104 pp.

Wigginton, B. E. 1963. Trees and Shrubs for the Southeast. Univ. Ga. Press, Athens. 280 pp.

Young, J. A., and C. G. Young. 1992. Seeds of Woody Plants in North America. Dioscorides Press, Portland, Oreg. 407 pp.

Zona, S. 1994. Beautyberry, an under-used native. Palmetto 14(1):3-4.

**APPENDIX A: COMMON AND SCIENTIFIC NAMES
OF PLANTS MENTIONED IN TEXT¹**

| <u>Common Name</u> | <u>Scientific Name</u> |
|-------------------------|-----------------------------|
| American beech | <i>Fagus grandifolia</i> |
| Ash | <i>Fraxinus</i> spp. |
| Blueberry spp. | <i>Vaccinium</i> spp. |
| Cabbage palmetto (palm) | <i>Sabal palmetto</i> |
| Flowering dogwood | <i>Cornus florida</i> |
| Greenbrier spp. | <i>Smilax</i> spp. |
| Hickory spp. | <i>Carya</i> spp. |
| Oak spp. | <i>Quercus</i> spp. |
| Water oak | <i>Q. nigra</i> |
| Post oak | <i>Q. stellata</i> |
| Live oak | <i>Q. virginiana</i> |
| Turkey oak | <i>Q. laevis</i> |
| Parsley hawthorn | <i>Crataegus marshallii</i> |
| Pine spp. | <i>Pinus</i> spp. |
| Loblolly pine | <i>P. taeda</i> |
| Longleaf pine | <i>P. palustris</i> |
| Shortleaf pine | <i>P. echinata</i> |
| Virbunum, Black haw | <i>Viburnum prunifolium</i> |
| Wax myrtle | <i>Myrica cerifera</i> |
| Witch hazel | <i>Hamamelis virginiana</i> |
| Yaupon | <i>Ilex vomitoria</i> |

¹ Scientific names follow Radford et al. (1968).

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| 13. ABSTRACT (Maximum 200 words) <p>A plant materials report on American beautyberry (<i>Callicarpa americana</i>) is provided as Section 7.5.8 of the U.S. Army Corps of Engineers Wildlife Resources Management Manual. The report was prepared as a guide to assist the Corps biologist with the selection, cultivation, and management of suitable plant materials for wildlife and habitat management programs. Major topics covered are description, distribution, habitat requirements, wildlife value, establishment, and maintenance.</p> <p>American beautyberry is a coarse, open shrub that occurs throughout the southeastern United States. The clusters of showy, bright violet to reddish-purple berries encircling the stem at regular intervals are diagnostic. Beautyberry is a hardy, drought-tolerant plant commonly occurring along field borders, roadsides, at the edges of woods, and in forest openings. It grows well in moist, moderately drained to well-drained fertile loams but is tolerant of infertile soils characteristic of disturbed sites. Beautyberry is considered to be of medium food and cover value for wildlife. Approximately 20 species of birds and several mammals feed on the fruit. It is a common browse species of white-tailed deer (<i>Odocoileus virginianus</i>) in the coastal plain.</p> | | | | | |
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